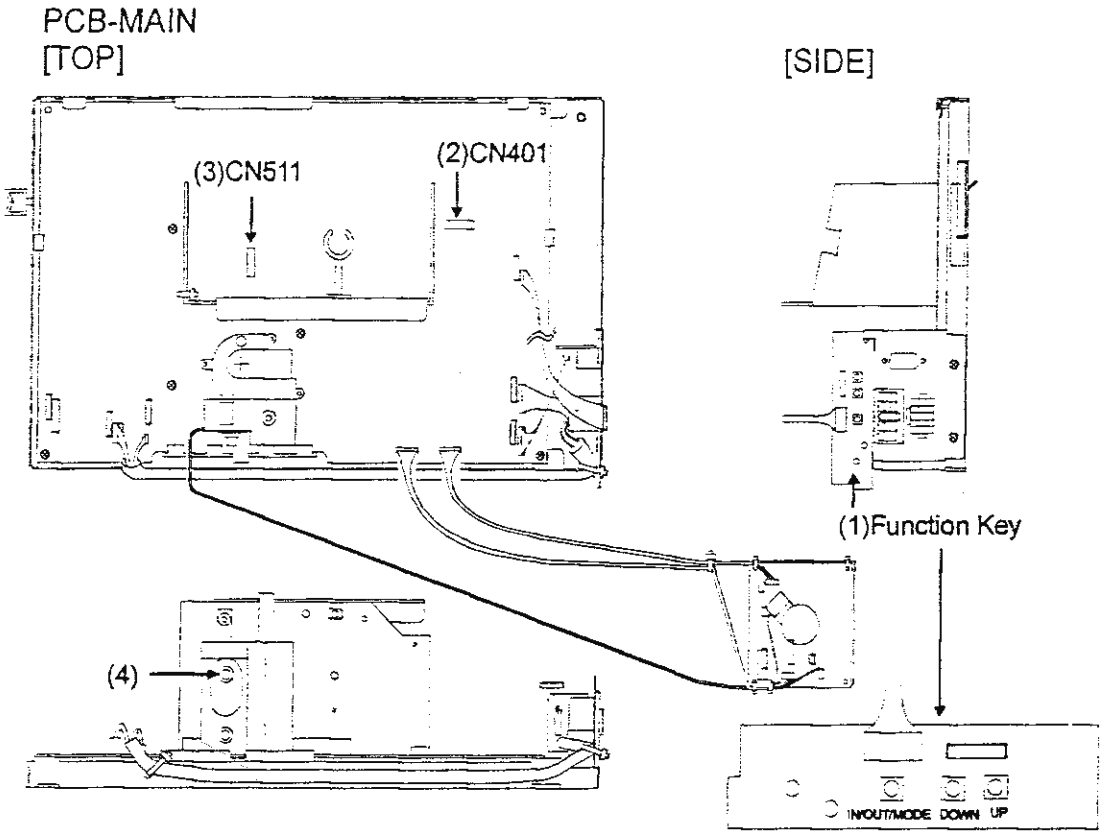
III Adjustments and Control

Do not touch any other volumes than the below volumes if not necessary.



1 Name

(1) Function Key: Display the OSD for screen adjustment
(2) The connector to switch the polarity of Deflection Yoke [CN401]
(3) The connector to switch the polarity of Deflection Yoke [CN511]
(4) FOCUS: Adjusts the focus

2 Adjustment by OSD (On Screen Display)

Use the Function Key (1) (MODE/UP/DOWN button)

● Operation

1. Pressing the MODE button displays the OSD (the right side number indicates input frequency)

Ex) 31kHz input

<OSD>

2. Press MODE button and select the adjustment menu.
(Whenever the MODE button presses, the OSD changes as V-POSI→H-POSI→V.SIZE→H-SIZE →CONTRAST→BRIGHT→DEGAUSS→RESET→OSD menu OFF)

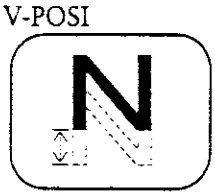
<Note>
Press the MODE button and DOWN button at same time, the adjustment menu returns to previous menu.

4. Adjust with UP/DOWN buttons.

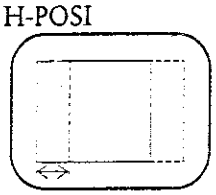
5. To hide the OSD, repeat pressing the MODE button until the menu is OFF.

● Adjustment Menu

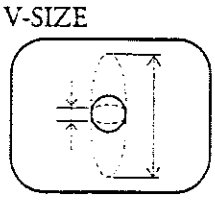
· V-POSI
Adjust the vertical position of image.



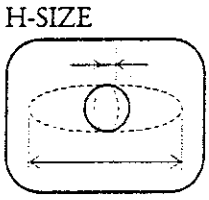
· H-POSI
Adjust the horizontal position of image.



· V-SIZE
Adjust the vertical dimension of the image



· H-SIZE
Adjust the horizontal dimension of the image.



· CONTRAST
Adjust the contrast of the image.

· BRIGHT
Adjust the brightness of the image.

· DEGAUSS
Perform the degauss.
Once degaussing, this function does not work for about 5 minutes. (Please wait until the lower OSD indicates <PLEASE> for the next degauss)

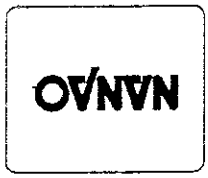
· RESET
The adjustments return to default setting. (Press the UP or DOWN button for a few seconds)

● Store the adjustment data

The proper image is automatically displayed to the 3 type input signal (H.Frequency: 15kHz Mode, 24kHz Mode, 31kHz Mode) as the factory setting. In addition, the user can store the 1 adjustment status to microprocessor in each mode. Therefore, the adjustment once made does not require further adjustment. To return the default setting, perform the <RESET> function at the OSD.

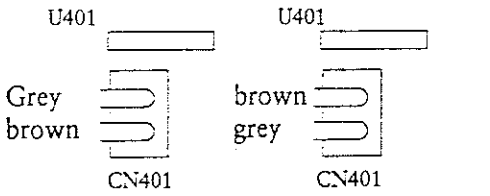
3 Other adjustment

- (2), (3) Switch the polarity of the Deflection Yoke

	CN401 (2) (NORMAL)	④CN401 (2) (REVERSE)
CN511 (3) normal connection	Normal Screen	Reversed Screen
CN511 (3) reverse connection	Mirrored	 180° rotated screen

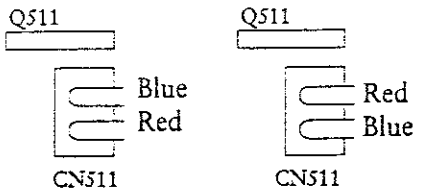
*CN401 (2)

Normal input Reversed connection



*CN511(3)

Normal input Reversed connection



- (4) FOCUS
  Adjust to get best focus.

4 Special Function

- Auto Switching function the display mode

  This model judges the input frequency automatically (H.frequency: 15kHz Mode, 24kHz Mode, 31 kHz Mode) and display the image.

Ⅳ Adjustments

1. Factory Adjustments

The factory adjustment uses the OSD appears by pressing the buttons connected to AMP-UP connector through the build-in microprocessor. Enter the factory mode for the factory adjustment.

1-1. Factory adjustment Mode

(1) To enter the factory mode, press the 3 buttons (MODE, UP, DOWN) at a same time (for 3 seconds) in the normal operation (Without OSD). Press the UP and DOWN button first and then press the MODE button,

(2) Whenever the MODE button pressed, the adjustment menu changes. To select the adjustment menu in the reversed order, press the DOWN button with pressing the MODE switch.

Please note that the adjustment menu changes continuously by pressing the MODE switch continuously.

---

(3) To change the data press the UP/DOWN button in each mode.

(4) After the adjustment, store the adjustment data in each frequency mode by SAVE.

(5) Return to Normal mode to end the factory mode. Press the MODE button until the OSD indicates "EXIT". Press the UP or DOWN button for a few seconds to return the normal mode

1-2. Factory adjustment menu

No.	menu	adjustment
1	FH0	horizontal sync check (Free run adjustment)
2	FH0-FINE	Horizontal sync. check (Free run adjustment)
3	R-SHIFT	Horizontal raster adjustment
4	V-LIN-S	Vertical linearity adjustment
5	V-LIN-C	Vertical linearity adjustment
6	V-POSI	Vertical position adjustment
7	H-POSI	Horizontal position adjustment
8	V-LIMIT	Vertical Size Limit adjustment
9	H-LIMIT	Horizontal Size Limit adjustment
10	V-SIZE	Vertical Width adjustment
11	H-SIZE	Horizontal Width adjustment
12	TRAPE	Trapezoidal distortion adjustment
13	PARA	Parallelogram distortion adjustment
14	BALANCE	Side-pin Balance distortion adjustment

No.	menu	adjustment
15	SPC	Side-pin cushion distortion adjustment
16	CORNER	Top/bottom corner distortion adjustment
17	R-CUTOFF	White balance adjustment for dark area
18	G-CUTOFF	White balance adjustment for dark area
19	B-CUTOFF	White balance adjustment for dark area
20	R-GAIN	White balance adjustment for bright area
21	G-GAIN	White balance adjustment for bright area
22	B-GAIN	White balance adjustment for bright area
23	ABL	ABL adjustment
24	C-CENTER	Center brightness adjustment
25	CONTRAST	Do not use. The contrast must be adjusted by C-CENTER
26	BRIGHT	Adjust the brightness
27	COLORCOPY	Store the adjustment data (Copy the adjustment data for R,G and B CUTOFF, R,G and B GAIN, ABL, C-CENTER and BRIGHT to each frequency mode)
28	DEGAUSS	Degaussing
29	SAVE	Store the adjustment data in each frequency mode
30	RESET	Return to the default setting
31	VERSION	Display the version of OSD
32	EXIT	Exit the factory mode

2. General Adjustment

Before starting the general adjustment, the following tools are recommended to do below tuning

- Degaussing Bar
- Electrostatic voltmeter
- Frequency Counter
- Signal generator which has same timing as the standard signal with 0.7Vp-p output, window pattern and white filed pattern
- Brightness meter
- DC Power Supply (more than 25V)
- Diode (Code Number : 00J25833A1, Description:1SS133)

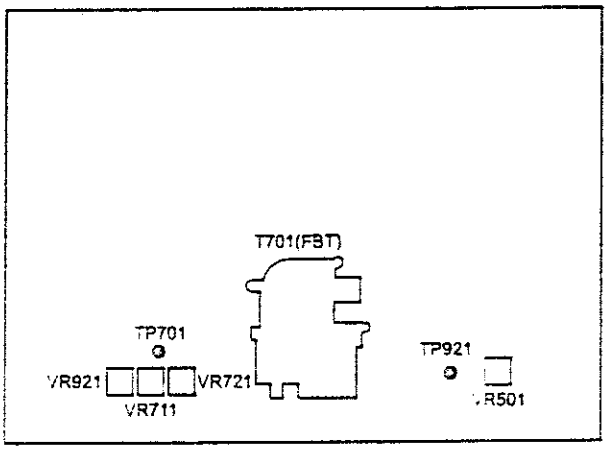
2-1. Signal

ROM No.	No.	Name	Mode	H/V	Frequency	Dotclock	Total	Sync	B.P	Video	Sync polarity	Video Level
1	A	Sega ST-V	15k	H[μs]	15.75kHz	14.32MHz	63.56	4.75	6.45	49.17	Comp	3.0Vp-p
				V[H]	59.82Hz		263	3	23	224	Nega	2kΩ
2	B	Sega Model3 (24k)	24k	H[μs]	24.39kHz	16.00MHz	41.00	3.00	4.44	30.69	Comp	0.7Vp-p
				V[H]	57.52Hz		424	4	28	381	Nega	75Ω
3	C	Sega Model3 (31k)	31k	H[μs]	31.67kHz	24.57MHz	31.58	3.58	1.75	25.92	Comp	0.7Vp-p
				V[H]	60.32Hz		525	2	36	477	Nega	75Ω
4	D	Size Limit 15k	15k	H[μs]	15.75kHz	14.32MHz	63.56	4.75	7.90	46.00	Comp	0.7Vp-p
				V[H]	59.82Hz		263	3	35	199	Nega	75Ω
5	E	Size Limit 24k	24k	H[μs]	24.39kHz	16.00MHz	41.00	3.00	5.54	28.40	Comp	0.7Vp-p
				V[H]	57.52Hz		424	4	40	354	Nega	75Ω
6	F	Size Limit 31k	31k	H[μs]	31.67kHz	24.57MHz	31.58	3.58	2.85	23.76	Comp	0.7Vp-p
				V[H]	60.32Hz		525	2	44	457	Nega	75Ω

2-2. Preset

Each adjustment volume must be preset at the following location before powering on except the case it has been adjusted.

No.	PCB	Symbol	name	Preset
1	MAIN	VR921	+B-ADJ	Center
2	↑	VR721	HV-ADJ	↑
3	↑	VR711	X-PRO	Clockwise. Max
4	↑	VR501	H-DRIVE	Counter-Clockwise.
5	↑	T701 (FBT)	SCREEN	↑
6	↑	T701 (FBT)	FOCUS	Center



<PCB-MAIN---Parts Side>

2-3. Before the adjustment

- Use the signal No.C (Rom No.3) Model 3 (31.6kHz) signal as the standard signal, unless otherwise specified.
- Input voltage should be 100 VAC.
- Connect the GND terminal to the chassis base or the radiator at the center of the PCB-MAIN.
- The CRT and the base should be degaussed.
- Make the pre-heat more than 30 minutes.
- The brightness in heat-running should be set 7 ft-L approx.
- The screen should face the east at adjusting, unless otherwise specified.
- The magnetic field should be set at the Japanese level (BV = 0.35G、BH =0.3G)

2-4. Adjustments

⚠WARNING

Do not short any position of the circuit while the monitor is in operation.

This will cause smoke, electric shock or damage to transistors, ICs or other parts or circuit in the unit. (Excluding the adjustment only when specified).

Be sure to save in each frequency mode in the adjustment by OSD

(indicated with OSD icon)

A. +B. adjustments ····· No signal

Use the +B-ADJ (VR921), adjust to get 180±0.2VDC at the voltage on TP921.

B. Preset ····· Cross-hatch

Turn the SCREEN VR slowly.

Adjust the SCREEN VR on the FBT so that the back-raster slightly appears. Adjust the FOCUS VR on the FBT to get the best-focused image.

C. Input connector check ····· Signal No. A、B

Switch the input connector and check there are no extraordinary on the screen image.

Video Input Mode	Input connector
Hi : Video 2kΩ termination (EH-6P(AMP 15P) input)	CN201
Lo : Video 75kΩ termination (D-SUB MINI 15P input)	CN251

D. H.Sync. check ····· No signal OSD

(1) Set the probe of the frequency counter at the DY red lead. Confirm that the free-run frequency shows the following values

(Once input the signal and remove the signal wire, the signal mode is available)

(1) 15kHz Mode 15.75±0.1kHz

(2) 24kHz Mode 24.40±0.1kHz

(3) 31kHz Mode 31.50±0.1kHz

(2) If they are not in the above range, readjust by fH0 or fH0-FINE at the factory mode.

Please note that, the value of fH0-FINE shows at 128 (middle range) after the adjustment with "fH0".

*Auto adjustment free-run frequency

Press the UP and DOWN button at same time for about 3 seconds with no signal input, the free-run frequency is automatically adjusted in every mode. (For about 15 seconds. requires)

Do not input any signal at the auto adjustment. Otherwise, the adjustment is stopped. (If any signal is input, the OSD shows "FREERUN AGAIN" for 3 seconds.

E. High Voltage adjustment ····· Cross-hatch Safety important adjustment

(1) Connect the electrostatic voltmeter at CRT anode.

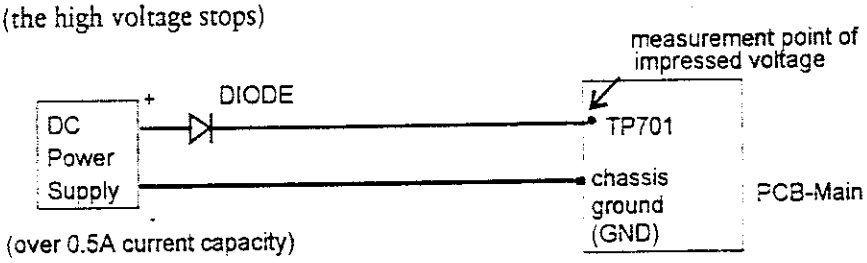
(2) With HV-ADJ (VR721) , adjust the high voltage to get 28.0±0.2kV.

(3) After the adjustment seal the HV-ADJ (VR721) with silicone.

F. X ray protector adjustment ····· Cross-hatch Safety important adjustment

(1) Check the voltage on TP701 shows 21.0±2.0 V with the X-PRO (VR711).

(2) Impress 24.05±0.05V to the TP701 from the DC power supply through the diode (1SS133) to protect DC Power supply. The minus terminal of DC Power supply shall be connected to the chassis ground (GND). (Use the DC Power supply of over 0.5A current capacity.) Turn the X-PRO (VR711) slowly and stops at the position the screen disappears (the high voltage stops)



G. X ray protector confirmation ····· Cross-hatch Safety important adjustment

(1) Confirm that there is no protector operation when you impress the 23.95V to TP701 from the DC power supply through the diode. (Refer to the figure above)

(2) After the confirmation, seal the X-PRO (VR711) with silicone rubber

H. H drive adjustment (VR501) ····· Cross-hatch

Adjust the VR501 to get the minimum voltage between the terminals of CN951 with the minimum H.Size. Seal the VR501 with the silicone rubber after the adjustment.

Use an extension connector when making adjustment.

I. Screen adjustment (SCREEN) ····· black field OSD

(1) Go into factory mode

(2) Select "BRIGHT" and maximize the value.

(3) Adjust the SCREEN VR (T701) to get 0.8±0.1ft-L.

(4) Adjust the white balance with "R, B-CUTOFF"

χ : 0.285±0.015

y : 0.285±0.015

(5) Repeat the (3) and (4) steps, if necessary.

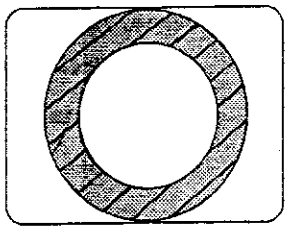
(6) After the adjustment, disappear the back-raster by using "BRIGHT"

(7) After the adjustment, perform the "COLOR COPY" and copy the data to the each mode. (Press the UP or DOWN button for a few seconds, the OSD shows "ON" and the "COLOR COPY" is performed.)

Do not touch SCREEN VR after the adjustment.

J. Focus adjustment ····· Cross-hatch

Adjust with FOCUS VR on the FBT to get the best focus in the right part (see the figure)



K. Degauss circuit confirmation····· white field OSD

Confirm that the screen is degaussed with the power ON or "DEGAUSS" of OSD with the magnetized set.

L. H. position adjustment ····· black field OSD

(1) Get into factory mode.

(2) Maximize the "BRIGHT" and set the "H.SIZE' to get under-scanned image.

(3) Adjust by using "R-SHIFT" to center the back-raster horizontally.

(The length from raster to bezel is within 1mm)

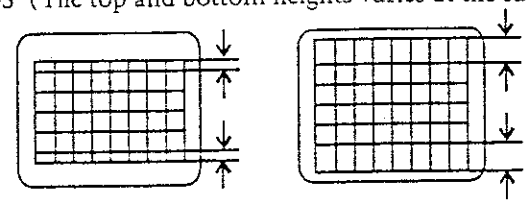
M. V.Linearity adjustment ····· Signal No. A、B、C, Cross-hatch OSD

(1) Get into factory mode.

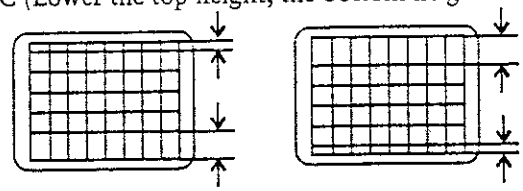
(2) Center the image vertically by using "V-POSI".

(3) Adjust by using "V-LIN-S" and "V-LIN-C" to get the same width the crosshatch pattern at top and bottom. (Refer to below)

V-LIN-S (The top and bottom heights varies at the same time)



V-LIN-C (Lower the top height, the bottom height is widened. Same as the opposite)



N. Distortion correction ····· Signal No. A、B、C, Cross-hatch OSD

Get into the factory mode and perform the necessary distortion adjustment.

TRAPE: Trapezoidal distortion

PARA: parallelogram distortion

BALANCE: Side-Pin Balance distortion

SPC: Side-pin cushion distortion

CORNER: Top/bottom corner distortion

O. Size/position adjustment ····· Signal No. A、B、C, Cross-hatch OSD

(1) Get into the factory mode.

(2) Adjust the Size and position to get the same size of the edge between the image and the CRT Screen by using "H-SIZE", "V-SIZE", "H-POSI" and V-POSI. (The length from raster to bezel is 5±3mm)

P. H.V Size Limit adjustment ····· Signal No. D, E,F, Cross-hatch OSD

(1) Get into the factory mode.

(2) Adjust the Size by using "V-LIMIT" and "H-LIMIT" so that the length from raster to the bezel is equal at top/bottom/right/left corner (The length from raster to bezel is 0±3mm)

Q. White balance adjustment for dark area ····· Signal No. A、B、C, Black field OSD

(1) Get into the factory mode.

(2) Maximize the "BRIGHT" value.

(3) Adjust the white balance of dark area by using "R-CUTOFF" and "B-CUTOFF"

χ : 0.285±0.010

y : 0.285±0.010

R. BRIGHT adjustment ····· Signal No. A、B、C, black-field OSD

(1) Get into the factory adjustment.

(2) Select the "BRIGHT" and adjust at the position the back-raster disappears.

S. Center brightness adjustment ····· Signal No. A、B、C Window OSD

(1) Get into the factory mode.

(2) Adjust by using "C-CENTER" to get the 60±2ft-L of white window center brightness

---

Use the "C-CENTER" only the center brightness adjustment.

T. White balances adjustment for bright area ····· signal No. A、B、C OSD

(1) Get into the factory mode.

(2) Adjust the white balance for bright area by using "R-GAIN" and "B-GAIN".

χ : 0.285±0.010

y : 0.285±0.010

(3) If necessary, repeat the center bright brightness adjustment and white balance adjustment for bright area.

U. ABL Adjustment ····· Signal No. A、B、C, white-field OSD

(1) Get into the factory adjustment mode.

(2) Adjust by using "ABL" to get the 30±1ft-L of white filed brightness.

V. ITC Adjustment

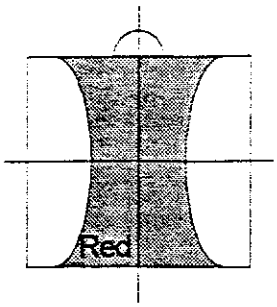
V-1 Magnetic field

Japanese level. Face the screen the east.

V-2 Preset of the static convergence

Using the degaussing bar, rhtoughly degauss and perform the static convergence adjustment roughly according to the V-4.

V-3 landing adjustment ····· Red field



(1) Shift the deflection Yoke ahead and rearward to get the best position.

(2) Hold the deflection Yoke to the CRT funnel (draw forward) and adjust so that the red zone centers horizontally by using 2P magnet.

(3) Shift the deflection Yoke backward at the position that the entire screen gets red. Fasten with screw with care of the rotation of the screen. Then, fix the deflection Yoke with wedge so that the oscillation of the deflection Yoke centers up/down/right/left. Adjust with blue and green raster. If necessary, perform the fine control.

(4) Confirm that white uniformity is favorable at the white raster. Rotate the screen to face all direction and confirm that conspicuous different colors shall not recognizable. If any, correct by using the magnet (08R50047A1) on the CRT funnel. After the adjustment, seal it with the silicone rubber (08F08087A1)

V-4 Static convergence

(1) Receive the cross-hatch signal and adjust to get the best focus.

(2) Receive the magenta cross-hatch signal and adjust the 4P magnet to align the Red/Blue cross hatch lines exactly one on top of another.
Rotation of the magnet (two magnets)—shifts the direction of two colors
Opening the magnet — shifts the distance between the two

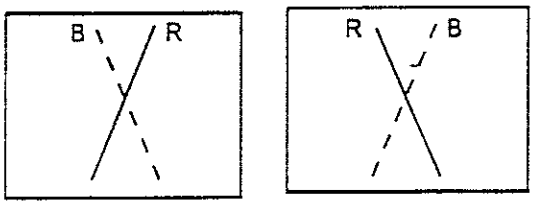
(3) Receive white cross-hatch signal. Rotate and adjust the 6P magnet to align the GREEN and MAGENDA cross-hatch lines exactly one on top of another.
Rotation of the magnet (two magnets)—shifts the direction of two colors
Opening the magnet — shifts the distance between the two
(The green pattern will remain stationary)

(4) Repeat above step (2) and (3), if necessary.

V-5 Dynamic convergence

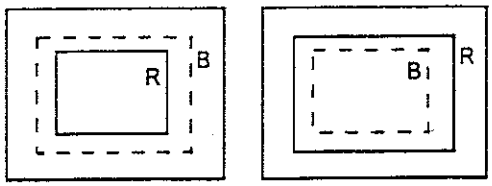
(1) Receive the magenta cross-hatch signal and adjust the mis-convergece.

(2) Move the DY top/downward and adjust the mis-convergence.



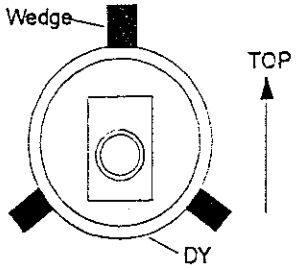
bottom top

(3) Shift the DY right or left and adjust to minimize the mis-convergence of each corner.

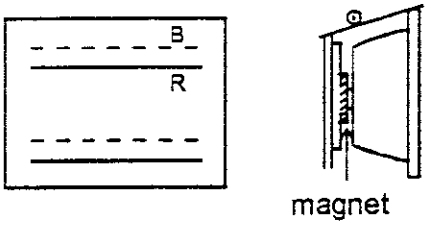


right left

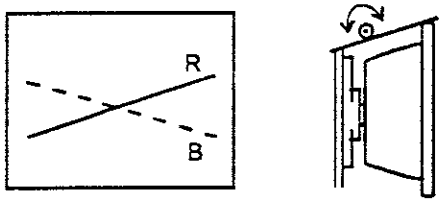
(4) Insert the wedge (08N46012A1) as follows and seal with silicon rubber (00F08221A1)



(5) Adjust the Yv by using magnet. (09F50363A1 or 09F50364A1) and seal with silicon rubber(08F08087A1)



(6) Adjust the Xv by the differential coil.



(7) If necessary, insert the ferrite sheet (08F50377A1) between the DY to CRT and adjust the mis-convergence of each corner area. After adjustment, seal with silicon rubber (08F08087A1)

V-6 Seal

- by YUKI Racker<yellow> (09F08139A1) at CP magnet, Screens on the DY, paint lock
- by silicone rubber (00F08221A1) <KE45RTV> at Wedge.